Lattice simulations of Born-Infeld non-linear QED

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Abstract: The non-linear QED action introduced by Born and Infeld has recently been revived as a field theory for strings and branes. Most of this work has studied the properties of classical Born-Infeld field theories. We use lattice simulations to study the properties of quantum Born-Infeld theories. To date we have studied the original Born-Infeld theory in 4 dimensions which should describe a 3-brane in 4 dimensions. One of the most important properties of the classical Born-Infeld field theory in 3+1 dimensions is that the electromagnetic fields emanating from a point charge are screened. We present preliminary evidence that this property survives quantization in a Euclidean 4-space formulation.